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Feature Cache

Each issue, *IC Online* brings you new feature content—some available exclusively online and some reprinted from *IEEE Internet Computing* magazine.

This *IC Online* Cache includes the features, interviews, e-mail roundtables, and resource pages of the past seven years, and organizes them by high-level topics that will evolve as the content changes.

To make suggestions on technical articles for *IC Online*, please contact lead editor [Steve Woods](#).

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Resource Pages

Agents

• Agents on the Web

The Sentient Web

Michael N. Huhns

People are often frustrated because the Web is unintuitive and unintelligent. With its huge memory capacity and computational ability, resources are not a limiting factor, but how likely is the possibility of some form of sentence? (From *Nov/Dec 2003*)

• AGENTS ON THE WEB

Making Agents Secure on the Semantic Web

Csilla Farkas and Michael N. Huhns

Traditional security models are largely inadequate for handling the many new risks that have emerged along with the rapid development of Web technologies, but significant efforts are under way. (From *Nov/Dec 2002*)

• ACL-Based Agent Systems

Heecheol Jeon, Charles Petrie, and Mark R. Cutkosky

Stanford Center for Design Research

Addendum to the article, "JATLite: A Java Agent Infrastructure with Message Routing," published in *IC* in *Mar./Apr. 2000*.

• Virtual Roundtable: The Future of Agents

As part of our recent issue on Internet-based software agents, *IC Online* asked some of the

leading figures in the field to talk about trends and issues in agent development. (From Jul/Aug 1997)

● **Pattie Maes: Humanizing the Global Computer**

"Now that we have a network, it's as though we already have our intelligent machine. It's a huge distributed system in which, like an ant society, none of the components are critical." (From Jul/Aug 1997)

● **Automating the Internet: Agents as User Surrogates**

Bruce Krulwich, *Agentsoft*

The explosion of the World Wide Web as a global information network brings with it a number of related challenges for automation. Agent technologies offer several solutions. (From Jul/Aug 1997)

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Application Technologies

● **GUEST EDITOR'S INTRODUCTION**

Database Technology on the Web

Elisa Bertino and Athman Bouguettaya

The database management system is a key enabling technology for the Internet's growth. The articles in this issue examine various ways that administrators and developers leverage database technologies to manage and mine large amounts of data. (From Jul/Aug 2002)

● **SCALING THE WEB: Load Testing of Web Sites**

Daniel A. Menascé

Load testing provides a way to assess IT infrastructure performance, which affects site QoS under varying traffic conditions. (From Jul/Aug 2002)

● **The Evolving Field of Distributed Storage**

Peter N. Yianilos and Sumeet Sobti

The Sept/Oct 2001 theme articles examine how distributed storage requires new metrics and tools that move beyond the limits of the traditional set.

● **Scalable Internet Services**

Fred Douglass and M. Frans Kaashoek

The Jul/Aug 2001 theme articles examine lessons learned with mechanisms for scaling Internet-based services. (From Jul/Aug 2002)

● **JXTA: A Network Programming Environment**

Li Gong • Sun Microsystems

JXTA aims to solve several problems in distributed computing, especially in P2P. (From May/Jun 2001.)

● **Arachnoid Tourist: Stuck in the Mud**

Robert Filman • NASA Ames Research Center

The Tourist takes a look at virtual communities and their underlying technologies. (From Jan/Feb 1998)

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E-Commerce

● GUEST EDITORS' INTRODUCTION**Business Processes on the Web****Charles Petrie and Akhil Sakai**

With the advent of service-centric computing, the virtual enterprise is fast becoming a reality as businesses outsource more functions electronically. (From Jan/Feb 2004)

● Visualizing Market Data**Christopher G. Healey and Peter R. Wurman**

Visualizations of auction activities enabled participants and observers in the International Conference on Multiagent Systems (ICMAS 2000) competition to follow games as they unfolded. (From Mar/Apr 2001)

● Tom Malone: Free on the Range

"What if you took the Internet, not just as a technical infrastructure for enabling business, which I think it certainly will be, but as an organizational model for how to manage a business?" (From May/Jun 1997)

● Bob Metcalfe: What's Wrong with the Internet?

"The Internet is the Information Age. Business people know that, even if they don't have a clear idea of what the business model is. The Internet is the hope of the future." (From Mar/Apr 1997)

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Embedded Systems

● Engineering Web Technologies for Embedded Applications**Ian Agranat, *Agranat Systems***

The founder of Agranat Systems examines design issues for developing effective embedded Web technologies. (From May/Jun 1998)

● Virtual Roundtable: Ubiquitous Computing

Ubiquitous Computing is driving design and interface efforts around the world. Join us as we look at what it is and what it might become. (From Mar/Apr 1998)

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Industry

● AlphaWorks: "Fast Tracking R&D" at IBM

This month, *IC Online* spoke with **Chris Bahr**, program director of IBM's alphaWorks division, which is helping redefine the way IBM conducts its new product development. (From Jul/Aug 1999)

● Sue Aragon-Stemel: Inside Cisco's Website

"I'd like to say we had a plan of grand proportions, but what really happened is the plan evolved as we built each new application." (From Nov/Dec 1997)

● John Paul: Network Systems

"There's only one thing bigger than Microsoft, and that's the Internet, right?" (From Sept/Oct 1997)

● Greg Sands: Netscape's SuiteSpot

"We want our clients to be able to scale...regardless of what operating system they use." (From Sept/Oct 1997)

● **Eric Schmidt: The Intranet Wars**

"Java has a lightweight threads model in which context switches are very fast. Because of that it's possible to have extremely high-performing, parallel protocol solutions. The development of these applications by talented programmers should be much more reliable than their equivalent using Windows NT." (From Sept/Oct 1997)

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Internet History

● **Dan Connolly: Architecture of the Web**

"Using the Web was supposed to be just like using a word processor, except you could link to anything on the planet." (From Mar/Apr 1998)

● **Robert Cailliau: the WWW Proposal**

"I think in retrospect the biggest mistake made in the whole project was the public release of the line-load browser." (From Jan/Feb 1998)

● **Len Kleinrock: "This is login"**

The behind-the-scene story of how the Internet came to be, as told by one of its founders. (From Mar/Apr 1997)

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Internet Measurement

● **CAIDA: Visualizing the Internet**

kc claffy * Cooperative Assoc. for Internet Data Analysis

Proposals for new protocols or techniques often make assumptions about traffic characteristics that are simply not empirically validated. CAIDA researchers are investigating techniques for bandwidth estimation, workload characterization, and long-term trend identification. (From Jan/Feb 2001)

● **What Can You Do with Traceroute?**

Steve Branigan, Hal Burch, Bill Cheswick,
and Frank Wojcik

By embedding Traceroute's functionality in a Unix-style filter, the authors create stunning visualizations of the Internet and intranets. (From Sept/Oct 2001)

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Java

● **Tutorial Examples: Integrating Java and CORBA:**

A Programmer's Perspective

Martin Schaaf and Frank Maurer

Download the examples used in the Jan/Feb 2001 *Spotlight* tutorial here as a single zip file. (From Jan/Feb 2001)

● Distributed Java Applets: Project Management on the Web**Eric Ly, *Netmosphere***

Without a common infrastructure, computer-supported collaborative tools for distributed teams have been prohibitively expensive to build and maintain. However, the increasing availability of the Internet is enabling companies to develop cost-effective collaborative solutions. (From *May/Jun 1997*)

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Middleware**● TOWARD INTEGRATION****The More Things Change...****Steve Vinoski**

Although technology's continuous march should make systems easier to develop, somehow the details always remain challenging. (From *Jan/Feb 2004*)

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Mobile/Wireless**● SPOTLIGHT****Understanding Link Quality in 802.11 Mobile Ad Hoc Networks****Gregor Gaertner and Vinny Cahill**

Mobile ad hoc wireless networks will extend the Internet into new territory, but low communication quality in current 802.11 ad hoc networks definitely impact application development. (From *Jan/Feb 2004*)

● GUEST EDITORS' INTRODUCTION**Ubiquitous Mobile Computing****Charles Petrie and Yih-Farn Robin Chen**

Recent advances in hardware and software technologies have created a plethora of mobile devices with a wide range of communication, computing, and storage capabilities. We are just beginning to explore the possibility of creating a world of ubiquitous mobile computing that keeps people connected to Internet applications and services at all times, regardless of their location or access device. (From *Mar/Apr 2003*)

● TOWARD INTEGRATION**The Performance Presumption****Steve Vinoski**

Choosing the right middleware means first determining the qualities that matter most for your application, and then evaluating different types of middleware to see how well they meet your requirements. Because of the difficulties involved in thoroughly and accurately evaluating middleware, however, consumers routinely take shortcuts. (From *Mar/Apr 2003*)

● IC Online: Wired-Wireless Integration: A Middleware Perspective**Giovanni Rimassa**

The evolution of mobile devices motivates developers to migrate technologies originally developed for PCs to wireless devices. Supporting this effort, however, requires new software—particularly middleware—to power small devices that connect over slow, sometimes unreliable networks. How well can today's major middleware platforms support wireless access to business applications? (From *Sept/Oct 2002*)

● On the Wire – 802.11: Leaving the Wire Behind

● **Steve Kapp** * Cisco Systems

The future of wireless networking never looked better, and 802.11 is the standard on which it is built today. (From Jan/Feb 2002)

● **TCP in the Wireless World**

Geoff Huston

The problem is no longer about adjusting TCP to the wireless environment, but of providing seamless interworking between wired and wireless worlds. (From March/Apr 2001)

● **Arachnoid Tourist: Spider on the Go**

Robert Filman * NASA Ames Research Center

The Tourist packs up his silk and explores mobile computing. (From Mar/Apr 1998)

● **Tutorial: Mobile Networking Through Mobile IP**

Charles E. Perkins, Sun Microsystems

"Mobile IP is a proposed standard that builds on the IP by making mobility transparent to applications and higher level protocols like TCP." (From Jan/Feb 1998)

● **A Look at Mitsubishi's Concordia**

Joseph Kiniry and Daniel Zimmerman

Mitsubishi's Java-based mobile agent system is designed to support enterprise computing and mobile platforms. (From Jul/Aug 1997)

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Networking Technologies

● **PEER TO PEER**

Is the Internet Going NUTSS?

Paul Francis

The IETF leadership needs to recognize that there is a good chance that IPv6 will never happen. It should start hedging its bets and take a serious look at a NAT-based approach as a valid next-generation architecture. (From Nov/Dec 2003)

● **GUEST EDITORS' INTRODUCTION**

The Grid Grows Up

Fred Douglass and Ian Foster

The Grid's success to date owes much to the relatively early emergence of clean architectural principles, de facto standard software, aggressive early adopters with challenging application problems, and a vibrant international community of researchers, developers, and users. (From Jul/Aug 2003)

● **PEER TO PEER**

Toward a Synergy Between P2P and Grids

Domenico Talia and Paolo Trunfio

In spite of current practices and thoughts, the grid and P2P models share several features and have more in common than we perhaps generally recognize. A synergy between the two research communities and the two computing models could exploit P2P protocols and models to face grid-computing issues such as scalability, connectivity, and resource discovery. (From Jul/Aug 2003)

● **PEER TO PEER**

Economics and the Design of Open Systems

David D. Clark

The implications of system modularity are particularly important for distributed systems operated by multiple profit-seeking commercial providers. In systems such as the Internet, modularity and interfaces shape not only technical design but also the very structure of the industry. System designers thus need to consider the industry structure that their modularity induces. (From Mar/Apr 2003)

● **GUEST EDITOR'S INTRODUCTION: Global Deployment of Data Centers**

Pankaj Mehra

Apart from an increased focus on security and the additional server software, the logical architecture of data centers should be able to meet the demands of these new applications without major changes. Important lessons for the future are thus available in today's solutions for global data center deployment. (From Sept/Oct 2002)

● **IC ONLINE FEATURE: Those Pesky NATs**

Joseph D. Touch

Network address translators have become a ubiquitous tool in the Internet landscape. It is what they disable that makes NATs nefarious. (From Jul/Aug 2002)

● **IC ONLINE**

Peering Beyond the PC: Where P2P Meets the Wireless Web

Richard Kilmer

Most existing P2P applications assume that peers are PCs, but wireless networking will extend P2P to new types of devices. (From May/Jun 2002)

● **Peer-to-Peer Networks in Action**

Li Gong • Sun Microsystems

The Jan/Feb 2002 theme articles examine what P2P has to offer and how it might be used in the marketplace. (From Jan/Feb 2002)

● **Virtual Private Networks:
Secure Access for E-Business**

Roger Younglove • Lucent Technologies

VPNs offer a cost-effective secure solution for connecting users to network resources. (From Jul/Aug 2000)

● **Optical Networking:
Canada's Third-Generation Internet Project**

Bill St. Arnaud and Andrew K. Bjerring

The Canadian Network for the Advancement of Research, Industry, and Education has deployed the world's first, nationwide optical Internet for research and education: CA*net3. (From May/Jun 2000)

● **Connecting the World:
A Scientific Network for Armenia**

M. Turatto et al.

Exploring radio-modem technology and satellite connectivity as a potential solution for bringing the Internet to the developing world, the authors describe their efforts in a project, sponsored by a NATO Grant, for connecting the main science institutes in Armenia's Ashtarak region. (From Sep/Oct 1999)

● **Abilene Comes Online
The Building of an Advanced IP Network**

"The primary purpose of pushing speed in the Abilene project is to stay ahead of the needs of the advanced applications." (From Nov/Dec 1998)

● **The Great Networking Correction: Frames Reaffirmed**

Kevin Tolly, The Tolly Group

The frame-based network technologies of local area networks are retaking their role as the

primary campus technology, providing connections from desktop through backbone. This development comes at the expense of cell-based ATM, which as recently as two years ago as widely viewed as the inevitable, and highly desirable, next wave in transport technologies. (From Sep/Oct 1997)

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